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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:

Philippe BOIRE, et al.,

: EXAMINER: A. PIZIALI RECEIVED

SERIAL NO.: 09/923,353

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: GROUP ART UNIT: 1775 TC 1700

FOR: SUBSTRATE WITH A PHOTOCATALYTIC COATING

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VA 22313-1450
SIR:

Now comes Léthicia Guéneau who deposes and states:

1. That I am a graduate of Paris VII University (Orsay)
and received a Ph.D degree in the year 1998.
2. That I have been employed by Saint-Gobain Recherche for
8 years as a researcher in the field of Physico-Chemistry / Self-cleaning glass.
3. That I understand the English language or, at least, that the contents of the

Declaration were made clear to me prior to executing the same.

4. I have read and understood Vandiest, (U.S. patent No. 5,721,054).
5. Vandiest describes a glazing panel produced by pyrolytic coating of a
substrate (see the Abstract). The coating contains an absorbent layer comprising at least one
oxide selected from chromium, cobalt, and iron. The coating also contains a non-absorbent
layer which comprises a material having a refractive index within the range of 1.4 to 3.0 (see
the Abstract). The purpose of the coating is to have low solar factor and a high purity of
reflected color (see column 2, lines 13-17). Vandiest fails to describe that the coating

described therein is photocatalytic or hydrophilic. In addition, Vandiest fails to describe that TiO_2 is crystallized in the anatase form.

6. In Example 2, Vandiest describes a glass substrate coated with a 41 nm TiO_2 layer, which, in turn, is coated with a layer of Fe, Co, and Cr oxides having a thickness of 45 nm.

7. In Example 3, Vandiest describes a glass substrate coated with a 85 nm TiO_2 layer, which, in turn, is coated with a layer of Fe, Co, and Cr oxides having a thickness of 46.5 nm.

8. Fe, Co, and Cr oxides are well-known to be poisons for photocatalysts. Therefore, one of ordinary skill in the art would limit the contents of those metal oxides because of their known properties as photocatalyst poisons.

9. I have read and understood Teowee, U.S. patent No. 5,604,626.

10. Teowee describes a photochromic device which allows a user to leave the device in a high transmissive state even when exposed to a source of radiation (see the Abstract). The device contains a radiation sensitive electrode 30 (see columns 7 and 8). Teowee fails to describe that the coating described therein is photocatalytic or hydrophilic.

11. In addition, the absence of a binder, especially in Example 1, leads to coatings with very low mechanical strength. Moreover, the operation involves heating to 450°C or 350°C, and, in the absence of a barrier layer, does not result in effective photocatalyst.

12. I have read and understood Kato, U.S. patent No. 6,284,314.

13. The thickness of the coatings described by Kato is much greater than 50 or 80 nm. In the Examples of that reference, the coating thickness is 400 nm (Example 1), 500 nm (Example 2), 300 nm (Example 3), 400 nm (Example 4), 600 nm (Example 5), 400 nm (Example 6), 800 nm (Example 7), 600 nm (Example 8), 0.5 μm (Example 9), 0.4 μm

(Example 10), 0.3 μm (Example 11), 0.5 μm (Example 12), 0.4 μm (Example 13), and 0.8 μm (Example 14). Thus, the thinnest coating described in the reference is 300 nm.

14. In describing the procedure for preparing the coating, Kato states:

it is desirable to produce a multilayer film by repeating a procedure which comprises depositing thinly and uniformly the ceramic sol...on a substrate...thereby forming a thin film of the solution on the substrate.... As a result, a sturdy porous ceramic thin film excellent in durability can be obtained. [Column 3, lines 33-42.]

15. Kato is completely silent regarding the size of titanium oxide crystallites.

16. Kato fails to describe the contact angle or the root mean square (RMS) rugosity of the coating.

17. There is no suggestion in Kato to produce a coating having a thickness which is 5 to 80 nm. Kato specifically directs one to prepare a coating using a multiple dipping technique, which would not suggest a coating that was only approximately 1/4 the thickness of the thinnest coating described in the reference. Kato certainly fails to suggest a coating which is 5 to 50 nm, which is only 1/6 as thick as the thinnest coating described in that reference.

18. Kato fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention titanium crystallites at all.

19. Kato does not identify a layer which functions as a barrier to alkali metals originating from the substrate, nor does the reference suggest that such a component would be desirable.

20. Kato is completely silent with respect to the contact angle of the coating.

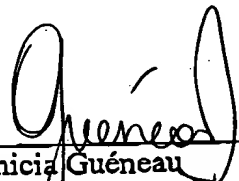
21. Kato is completely silent with respect to the RMS rugosity of the coating and, therefore, fails to suggest a coating having a value between 2 and 20 nm.

22. In addition, Kato describes the optional heating of solutions coated on substrates in the absence of a barrier layer to alkalis, such as sodium from the substrate. Quartz glass substrates are described, which consist of SiO_2 , and do not contain alkalis.

23. As discussed above, the purpose of the coating described in Vandiest is to have low solar factor and a high purity of reflected color (see column 2, lines 13-17 of the reference). Vandiest fails to describe that the coating described therein is photocatalytic or hydrophilic. In addition, the glazing described by Vandiest is to be used for architectural buildings and not as a windshield.

24. The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

25. Further deponent saith not.


Léthicia Guéneau

3rd of Décembre, 2003
Date